

A capillary pump two phase heat transport system that combines the most favorable characteristics of a capillary pump loop (CPL) with the robustness and reliability of a loop heat pipe (LHP). Like a CPL, the hybrid loop has plural parallel evaporators, plural parallel condensers, and a back pressure flow regulator. Unlike CPLs, however, the hybrid system incorporates elements that form a secondary loop, which is essentially a LHP that is co-joined with a CPL to form an inseparable whole. Although secondary to the basic thermal management of the system thermal bus, the LHP secondary loop portion of the system provides for important operational functions that maintain healthy, robust and reliable operation. The LHP secondary loop portion provides a function of fluid management during start-up, steady state operation, and heat sink/heat source temperature and power cycling.